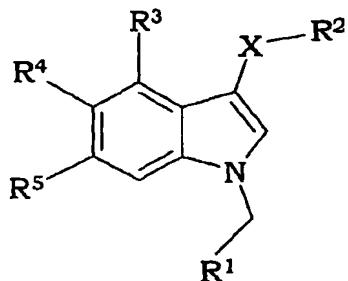


Claims

1. A compound having the formula



5 wherein

X is S, SO or SO₂;

10 R¹ is a 5- or 6-membered monocyclic, hetero- or homocyclic, saturated or unsaturated ring structure, optionally substituted with one or more substituents selected from the group consisting of halogen, CN, (1C-4C)fluoroalkyl, nitro, (1C-4C)alkyl, (1C-4C)alkoxy or (1C-4C)fluoroalkoxy;

R² is 2-nitrophenyl, 2-cyanophenyl, 2-hydroxymethyl-phenyl, pyridin-2-yl, pyridin-2-yl-N-oxide, 2-benzamide, 2-benzoic acid methyl ester or 2-methoxyphenyl;

R³ is H, halogen or (1C-4C)alkyl;

R⁴ is H, OH, (1C-4C)alkoxy, or halogen;

15 R⁵ is H, OH, (1C-4C)alkoxy, NH₂, CN, halogen, (1C-4C)fluoroalkyl, NO₂, hydroxy(1C-4C)alkyl, CO₂H, CO₂(1C-6C)alkyl, or

R⁵ is NHR⁶, wherein R⁶ is (1C-6C)acyl optionally substituted with one or more halogens, S(O)₂(1C-4C)alkyl, or S(O)₂aryl optionally substituted with (1C-4C)alkyl or one or more halogens, or

20 R⁵ is C(O)N(R⁸,R⁹), wherein R⁸ and R⁹ each independently are H, (3C-6C)cycloalkyl, or CH₂R¹⁰, wherein R¹⁰ is H, (1C-5C)alkyl, (1C-5C)alkenyl, hydroxy(1C-3C)alkyl, (1C-4C)alkylester of carboxy(1C-4C)alkyl, (1C-3C)alkoxy(1C-3C)alkyl, (mono- or di(1C-4C)alkyl)aminomethyl, (mono- or di(1C-4C)alkyl)aminocarbonyl, or a 3-, 4-, 5- or 6-membered monocyclic, homo- or heterocyclic, aromatic or non-aromatic ring, or R⁸ and R⁹ form

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together with the N a heterocyclic 5- or 6-membered saturated or unsaturated ring optionally substituted with (1C-4C)alkyl;
or a salt or hydrate form thereof.

5 2. A compound according to claim 1, characterised in that

R¹ is a 5- or 6-membered monocyclic, hetero- or homocyclic, saturated or unsaturated ring structure optionally substituted with one or more substituents selected from the group consisting of halogen, CN, CF₃, nitro, methoxy, trifluoromethoxy or methyl;

10 R² is 2-nitrophenyl, 2-cyanophenyl, 2-hydroxymethyl-phenyl, pyridin-2-yl, pyridin-2-yl-N-oxide, 2-benzamide, 2-benzoic acid methyl ester or 2-methoxyphenyl;

R³ is H, halogen or (1C-2C)alkyl;

R⁴ is H or F.

15 3. A compound according to claim 2, characterised in that

R⁵ is H, OH, (1C-4C)alkoxy, CN, halogen, (1C-4C)fluoroalkyl, NO₂, hydroxy(1C-4C)alkyl, CO₂(1C-6C)alkyl, or

R⁵ is NHR⁶, wherein R⁶ is (1C-6C)acyl optionally substituted with one or more halogens, S(O)₂(1C-4C)alkyl, or S(O)₂aryl optionally substituted with (1C-4C)alkyl or one or more halogens, or

20 R⁵ is C(O)N(R⁸,R⁹), wherein R⁸ and R⁹ each independently are H, (3C-6C)cycloalkyl, or CH₂R¹⁰, wherein R¹⁰ is H, (1C-5C)alkyl, (1C-5C)alkenyl, hydroxy(1C-3C)alkyl, (1C-4C)alkylester of carboxy(1C-4C)alkyl, (1C-3C)alkoxy(1C-3C)alkyl, (mono- or di(1C-4C)alkyl)aminomethyl, (mono- or di(1C-4C)alkyl)-aminocarbonyl, or a 3-, 4-, 5- or 6-membered monocyclic, homo- or heterocyclic, aromatic or non-aromatic ring, or R⁸ and R⁹ form together with the N a heterocyclic 5- or 6-membered saturated or unsaturated ring optionally substituted with (1C-4C)alkyl.

25 30 4. A compound according to claim 3, characterised in that

R³ is H or halogen;

R⁴ is H;

R^5 is H, OH, (1C-4C)alkoxy, CN, F, Cl, CF_3 , NO_2 , hydroxy(1C-4C)alkyl, $CO_2(1C-6C)$ alkyl, or

R^5 is NHR^6 , wherein R^6 is (1C-3C)acyl optionally substituted with one or more halogens or

5 R^5 is $C(O)N(R^8, R^9)$, wherein R^8 and R^9 each independently are H, (3C-5C)cycloalkyl, or CH_2R^{10} , wherein R^{10} is H, (1C-5C)alkyl, (1C-5C)alkenyl, hydroxy(1C-3C)alkyl, (1C-2C)alkylester of carboxy(1C-2C)alkyl, (1C-3C)alkoxy(1C-3C)alkyl, (mono- or di(1C-4C)alkyl)aminomethyl, (mono- or di(1C-4C)alkyl)aminocarbonyl, (3C-5C)cycloalkyl, or a 5-membered 10 heterocyclic ring.

5. A compound according to claim 4, characterised in that

X is S or SO_2 ;

R^2 is 2-nitrophenyl, 2-hydroxymethyl-phenyl, 2-benzamide, 2-methoxyphenyl, 2-15 cyanophenyl or pyridin-2-yl;

R^3 is H or F;

R^5 is H, OH, (1C-2C)alkoxy, CN, F, Cl, CF_3 , NO_2 , hydroxy(1C-4C)alkyl, $CO_2(1C-4C)$ alkyl, or

R^5 is NHR^6 , wherein R^6 is formyl, acetyl, fluoroacetyl, difluoroacetyl, or 20 trifluoroacetyl, or

R^5 is $C(O)N(R^8, R^9)$, wherein R^8 is H, and R^9 is H, cyclopropyl or R^9 is CH_2R^{10} , wherein R^{10} is H, (1C-2C)alkyl, hydroxy(1C-2C)alkyl, methoxy(1C-2C)alkyl, cyclopropyl.

25 6. A compound according to claim 5, characterised in that

X is S;

R^1 is 3,5-difluorophenyl, pyridin-2-yl, pyridin-3-yl, pyrimidin-5-yl, pyrimidin-4-yl, pyrazin-2-yl, 3-fluorophenyl, 3-cyanophenyl, or 3-nitrophenyl;

R^2 is 2-nitrophenyl, 2-hydroxymethyl-phenyl, 2-methoxyphenyl, 2-cyanophenyl or 30 pyridin-2-yl;

R^3 is H;

R^5 is OH, (1C-2C)alkoxy, CN, CF₃, NO₂, hydroxy(1C-4C)alkyl, CO₂(1C-4C)alkyl, or NHR⁶, wherein R⁶ is formyl, acetyl, fluoroacetyl, difluoroacetyl, or trifluoroacetyl.

5 7. A compound according to claim 6, characterised in that

R^1 is 3,5-difluorophenyl, pyridin-2-yl, pyridin-3-yl, pyrimidin-5-yl, pyrimidin-4-yl, or pyrazin-2-yl;

R^2 is 2-nitrophenyl, or 2-hydroxymethyl-phenyl;

R^5 is OH, (1C-2C)alkoxy, CN, hydroxy(1C-4C)alkyl, or NHR⁶, wherein R⁶ is formyl, acetyl, fluoroacetyl, difluoroacetyl, or trifluoroacetyl.

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8. A compound according to claim 7, characterised in that

R^1 is 3,5-difluorophenyl, pyridin-2-yl, pyridin-3-yl, pyrimidin-5-yl, or pyrimidin-4-yl;

15 R^2 is 2-nitrophenyl;

R^5 is OH, (1C-2C)alkoxy, CN, or NHR⁶, wherein R⁶ is formyl, acetyl, fluoroacetyl, difluoroacetyl, or trifluoroacetyl.

9. A compound according to claim 8 selected from the group consisting of 6-

20 Methoxy-3-(2-nitro-phenylsulfanyl)-1-pyrimidin-5-ylmethyl-1*H*-indole, 3-(2-

Nitro-phenylsulfanyl)-1-pyridin-2-ylmethyl-1*H*-indole-6-carbonitrile, 3-(2-Nitro-

phenylsulfanyl)-1-pyridin-2-ylmethyl-1*H*-indole-6-carbonitrile-hydrochloride, 3-

(2-Nitro-phenylsulfanyl)-1-pyrimidin-5-ylmethyl-1*H*-indole-6-carbonitrile, 3-(2-

Nitro-phenylsulfanyl)-1-pyrimidin-4-ylmethyl-1*H*-indole-6-carbonitrile, N-[1-

25 (3,5-Difluoro-benzyl)-3-(2-nitro-phenylsulfanyl)-1*H*-indol-6-yl]-2-fluoro-

acetamide, and N-[3-(2-Nitro-phenylsulfanyl)-1-pyrimidin-5-ylmethyl-1*H*-indol-

6-yl]-formamide.

10. A compound according to claim 5, characterised in that

30 X is S;

R^1 is 3,5-difluorophenyl, pyridin-2-yl, pyridin-3-yl, 3-fluorophenyl, 3-cyanophenyl, or 3-nitrophenyl;

R^2 is 2-nitrophenyl, 2-hydroxymethyl-phenyl, 2-methoxyphenyl, 2-cyanophenyl or pyridin-2-yl;

R^3 is H;

R^5 is $C(O)N(R^8, R^9)$, wherein R^8 is H, and R^9 is H, or CH_2R^{10} , wherein R^{10} is H, (1C-

5 2C)alkyl, hydroxy(1C-2C)alkyl, or methoxy(1C-2C)alkyl.

11. A compound according to claim 10, characterised in that

R^1 is 3,5-difluorophenyl, pyridin-2-yl, or pyridin-3-yl;

R^2 is 2-nitrophenyl, or 2-hydroxymethyl-phenyl;

10 R^5 is $C(O)N(R^8, R^9)$, wherein R^8 is H, and R^9 is CH_2R^{10} , wherein R^{10} is H, or (1C-

2C)alkyl.

12. A compound according to claim 11 which is 1-(3,5-Difluoro-benzyl)-3-(2-nitro-phenylsulfanyl)-1*H*-indole-6-carboxylic acid methylamide.

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13. A compound according to claim 4, characterised in that

X is S;

R^1 is 3,5-difluorophenyl, pyridin-2-yl, pyridin-3-yl, 3-fluorophenyl, 3-cyanophenyl, or 3-nitrophenyl;

20 R^2 is 2-nitrophenyl, 2-hydroxymethyl-phenyl, 2-methoxyphenyl, 2-cyanophenyl or pyridin-2-yl;

R^3 is H;

R^5 is $C(O)N(R^8, R^9)$, wherein R^8 and R^9 each independently are H, or CH_2R^{10} , wherein R^{10} is H, (1C-5C)alkyl, (1C-5C)alkenyl, hydroxy(1C-3C)alkyl, (1C-

25 3C)alkoxy(1C-3C)alkyl, or (mono- or di(1C-4C)alkyl)aminomethyl.

14. A compound according to claim 13, characterised in that

R^1 is 3,5-difluorophenyl, pyridin-2-yl, or pyridin-3-yl;

R^2 is 2-nitrophenyl, or 2-hydroxymethyl-phenyl;

R^5 is $C(O)N(R^8, R^9)$, wherein R^8 and R^9 each independently are H, or CH_2R^{10} , wherein R^{10} is H, (1C-5C)alkyl, hydroxy(1C-3C)alkyl, or (1C-3C)alkoxy(1C-3C)alkyl.

5 15. A compound according to claim 14 which is 1-(3,5-Difluoro-benzyl)-3-(2-nitro-phenylsulfanyl)-1*H*-indole-6-carboxylic acid dimethylamide.

16. The compound of any one of claims 1-15 for use in therapy.

10 17. A pharmaceutical composition comprising a compound according to any one of claims 1-15 and a pharmaceutically acceptable carrier.

18. A pharmaceutical composition according to claim 17 for the treatment of a disorder selected from the group consisting of an androgen-receptor related disorder, an
15 androgen related disorder and androgen insufficiency.

19. A use of a compound according to any one of claims 1-15 for the manufacture of a medicament for the treatment of androgen-receptor related disorders, androgen related disorders and androgen insufficiency.

20 20. A method of treating a disorder selected from the group consisting of an androgen-receptor related disorder, an androgen related disorder and androgen insufficiency comprising administering a pharmaceutically effective amount of a compound according to any one of claims 1-15 to a subject in need thereof.

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